Dopamine synthesis in psychosis: relationship to cannabis and treatment response

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Introduction: Dopamine synthesis capacity is elevated in patients with schizophrenia. However, it is not known how this alters during the development of psychosis, or in people at risk of psychosis due to exposure to cannabis, or how this relates to treatment and changes during the course of illness.

Methods: [18F]DOPA PET imaging was used to index dopamine synthesis capacity in people with prodromal symptoms of schizophrenia who were re-scanned as they developed psychosis, in a cohort of people who experienced sub- clinical psychotic-like symptoms when they were exposed to cannabis, and in another cohort of patients with first episode psychosis who were re-scanned during the course of their illness as well as matched controls.

Results: Dopamine synthesis capacity was elevated in people prior to the onset of psychosis (effect size = 0.8, \( p < 0.001 \)), and increased longitudinally with the development of psychosis \( (p < 0.05) \). Dopamine synthesis capacity was elevated in first episode patients who responded to treatment \( (\text{effect size} = 1.3, \ p < 0.05) \) and did not change during the early course of illness. Furthermore, dopamine synthesis capacity was related to treatment response \( (\tau = 0.6, \ p < 0.05) \). People who experienced psychotic-like symptoms when exposed to cannabis showed reduced dopamine synthesis capacity.

Discussion: These data suggest that the dopamine synthesis capacity is linked to the development of psychosis and response to treatment in the first episode. Cannabis use is associated with reduced dopamine synthesis.

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